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Oribatids from Madagascar I. (Acari: Oribatida)

New and interesting mites from the Geneva Museum LXXVI.

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Oribatids from Madagascar I. (Acari: Oribatida). - Fifteen Oribatid species are identified, ten of them are described as new to science. For one species it was necessary to establish a new genus: *Nosybea* gen. n., which represent also a new family, *Nosybeidae* fam. n., in the superfamily *Charassobatoidea*. For another species a new subgenus is established within the genus *Acaroceras: Malgoceras* subgen. n.

Key-words: Acari - Oribatida - Taxonomy - Madagascar.

INTRODUCTION

The Madagascan fauna of soil mites, including Oribatids, must still be considered as rather imperfectly known in spite of the fact that some data exist (Balogh 1960, 1962a, 1962b; Mahunka 1983, 1990). This situation is a source of considerable difficulty not only for taxonomic studies in this area but also for any zoogeographical analysis on a larger scale, since a sound knowledge of the fauna of this peculiar island is of key importance for comparisons between the separated parts of the Gondwana continent.

In the frame of a Hungarian Research Project (OTKA 3165) a comparative investigation on the Oribatida (by the author), the Trichoptera (by Dr. János Oláh) and the moss flora (by Dr. Tamás Pócs) will be undertaken.

The most urgent requirement was to procure new material for more taxonomic and faunistic study. This was undertaken by Dr. Bernd Hauser, the Swiss participant of the project, Head of the Arthropod Department of the Muséum d'Histoire naturelle, Geneva, who organized an entomological expedition together with Dr. Charles

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Lienhard, Research Officer at the same Department. In autumn 1989 Dr. B. Hauser collected a number of soil samples originating from different points of the island. The elaboration of the extremely rich material extracted from these samples requires prolonged study, hence I intend firstly to publish a series of papers containing the taxonomic and faunistic results. Biogeographic analyses will follow in a later phase of the project.

In the description I generally apply the terminology used in several publications by NORTON (e. g. 1982) and BEHAN-PELLETIER (e. g. 1984) based on Grandjean's work. The pilosity of the parts of the body and of the legs is expressed in formulae. The sequence of the anogenital formula is: number of genital, aggenital, anal and adanal setae. Within the setal formula of the palp and the legs, the solenidia of a given segment are marked with the symbol +. Measurements given correspond to extremes observed in the present material; length is measured from the rostral apex to the furthermost opposite point of the body, width refers to maximum body width (in the case of movable pteromorphae to maximum width without pteromorphae).

LIST OF LOCALITIES

Mad-89/3: MADAGASCAR: (Prov. Tamatave: Sous-préf. Morsamanga): Réserve spéciale "Analamazoatra" (anciennement Perinet) près d'Andasibe, forêt primaire, prélèvement de sol au pied de *Ravensara* sp. (*Lauraceae*), 1020 m, extraction par appareil Berlese, 21.XI.1989, leg. B. Hauser.

Mad-89/34: MADAGASCAR: (Prov. Antsiranana [anciennement Diego-Suarez]: Sous-préf. Andoany [anciennement Hell-Ville]): Ile de Nosy Be, Réserve naturelle intégrale "Lokobe", forêt primaire près d'Ampasindava, prélèvement de sol dans les angles formés par les contreforts d'un grand arbre en décomposition mais encore debout, 80 m, extraction par appareil Berlese, 30.XI.1989, leg. B. Hauser.

LIST OF IDENTIFIED SPECIES

Eniochthoniidae Grandjean, 1947

Hypochthoniella sumatrana Mahunka, 1989
Locality: Mad-89/3: 2 specimens.
Distribution: Sumatra (MAHUNKA 1989); **new for Madagascar**.

Lohmanniidae Berlese, 1916

Javacarus porosus Hammer, 1980
Locality: Mad-89/34: 1 specimen.
Distribution: Java (HAMMER 1980); **new for Madagascar.**

Phthiracaridae Perty, 1841

Hoplophorella lemuria sp. n.
Locality: Mad-89/3.

Euphthiracaridae Jacot, 1930

Microtritia hauseri sp. n.
Locality: Mad-89/3.

Nosybeidae fam. n.

Nosybea genavensis gen. n., sp. n.
Locality: Mad-89/34.

Microzetidae Grandjean, 1936

Acaroceras (*Malgoceras* subgen. n.) *helleri* sp. n.
Locality: Mad-89/34.

Hymenozetes quadricornutus sp. n.
Locality: Mad-89/34.

Megazetes nosybe sp. n.
Locality: Mad-89/34.

Rhopalozetes lokobensis sp. n.
Localities: Mad-89/3; Mad-89/34.

Rhopalozetes madecassus sp. n.
Locality: Mad-89/3.

Eremulidae Grandjean, 1965

Caveremulus cordisetus Mahunka, 1983
Locality: Mad-89/34: 2 specimens.
Distribution: Madagascar (Mahunka 1983).

Peloppiidae Balogh, 1943

Trichoppia longiseta Balogh, 1960
Locality: Mad-89/3: 2 specimens.
Distribution: Madagascar (Balogh 1960).

Carabodidae C.L. Koch, 1837

Carabodes andasibe sp. n.
Locality: Mad-89/3.

Carabodes lunaris Balogh, 1962
Locality: Mad-89/34: 10 specimens.
Distribution: Madagascar (Balogh 1962b).

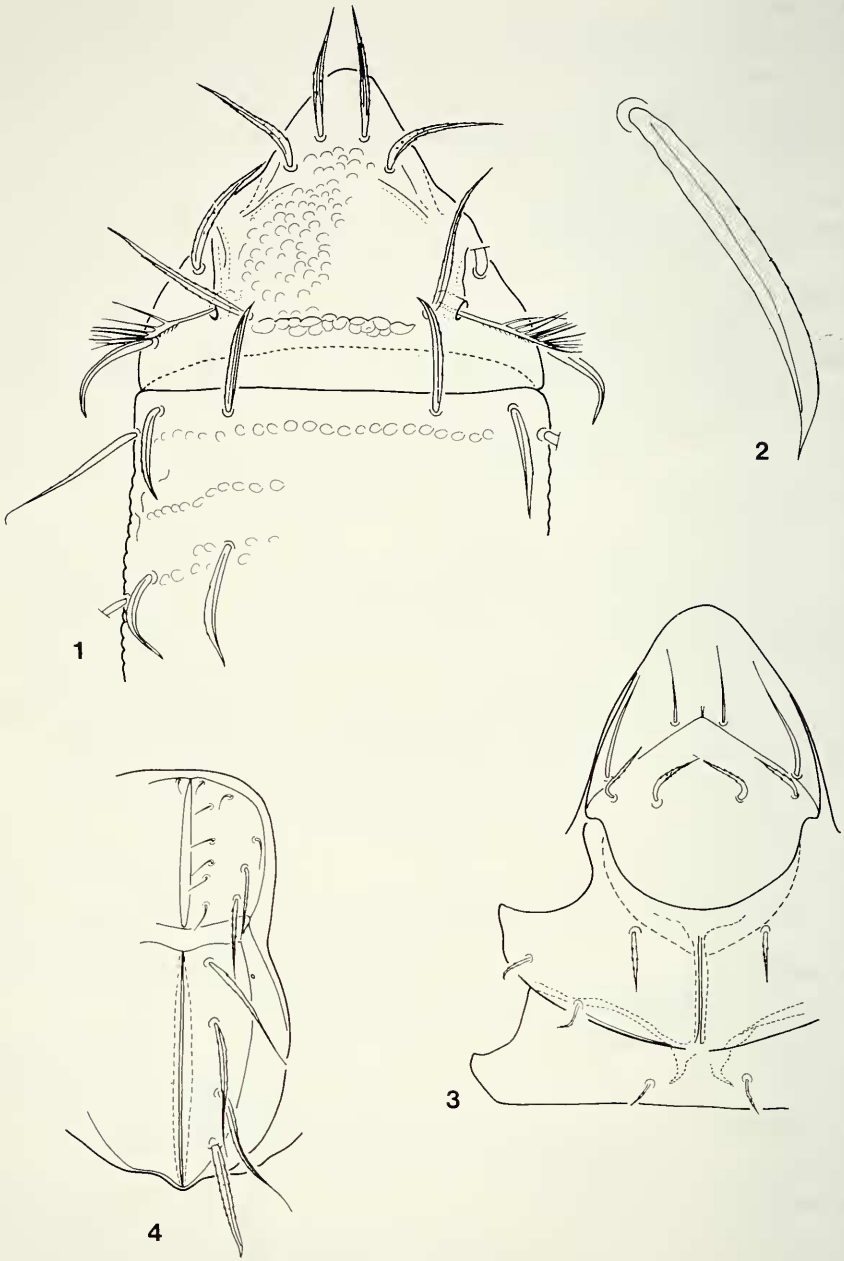
Otocepheidae Balogh, 1961

Pseudotocepheus lienhardi sp. n.
Locality: Mad-89/3.

DESCRIPTIONS

Javacarus porosus Hammer, 1980

The identification of this species - without revision of the type which will be done at a later date - is rather difficult, because the original drawings and the description of the author do not correspond in every detail. Therefore I give some figures of the specimen collected in Madagascar (Figs 1-4).



FIGS 1-4.

Javacarus porosus Hammer, 1980 - 1: anterior part of body in dorsal view, 2: seta d_1, 3: epimeral region, 4: anogenital region.

Hoplophorella lemuria sp. n.

M e a s u r e m e n t s . - Length of aspis: 143-150 µm, length of notogaster: 280-296 µm, height of notogaster: 157-175 µm.

A s p i s : Median crista low, lateral carina absent, lateral rim short and narrow, the sinus line observable. The whole surface ornamented by large foveolae except the lateral part. Sensillus asymmetrically dilated, well spiculate on its laterodorsal surface (Fig. 10).

N o t o g a s t e r : A well developed anterior hood present, behind it a deep median hollow, divided by a central rib into two parts (Fig. 6). Some weak tubercles on the notogaster also exist, (probably 4 pairs) observable mostly in dorsal view only (Fig. 6). Notogaster covered by a thick cerotegument layer, its surface alveolate. All fifteen pairs of notogastral setae thin, simple, curved.

A n o g e n i t a l r e g i o n : Genital plates much larger than the anal ones. Setae g_6-g_9 arising only on the outer surface, setae g_1-g_5 setae originating very near to each other in front of the tectum *kag* (Fig. 9). All five pairs of anal setae very short, spiniform, their position typical for the genus.

G n a t h o s o m a : Palps 3-segmented, with setal formula: 2-2-7+1. Seta *d* of femur much shorter than *v'*, seta *sul* thin and also much shorter than the other eupathidia.

L e g s : Claw of leg I with 2 well developed teeth. Seta *d* of all femora thick and well ciliate. Femur III and IV with porose area ventrolaterally. Seta *d* on tibia IV minute, coupled with the solenidion φ. Seta *ft'* on tarsus I absent. Setal formula of the legs:

I: 1-4-2+2-5+1-16+3-1 (Figs 7-8)
II: 1-3-2+1-4+1-12+2-1
IV: 2-1-1-2+1-10-1

M a t e r i a l e x a m i n e d : Holotype: Mad-89/3, 3 paratypes from the same sample. Holotype and 2 paratypes deposited in the MHNG[1] and 1 paratype (1388-PO-1990) in the HNHM[2].

R e m a r k s : The new species stands very near to *Hoplophorella balazsi* Mahunka, 1983, described also from Madagascar. The latter can be well distinguished from the new species by the much longer and velate sensillus, the strong tubercles of the notogaster and by the much larger alveoli on the notogaster surface.

Microtritia hauseri sp. n.

M e a s u r e m e n t s . - Length of aspis: 182-220 µm, length of notogaster: 305-394 µm, height of notogaster: 273-287 µm.

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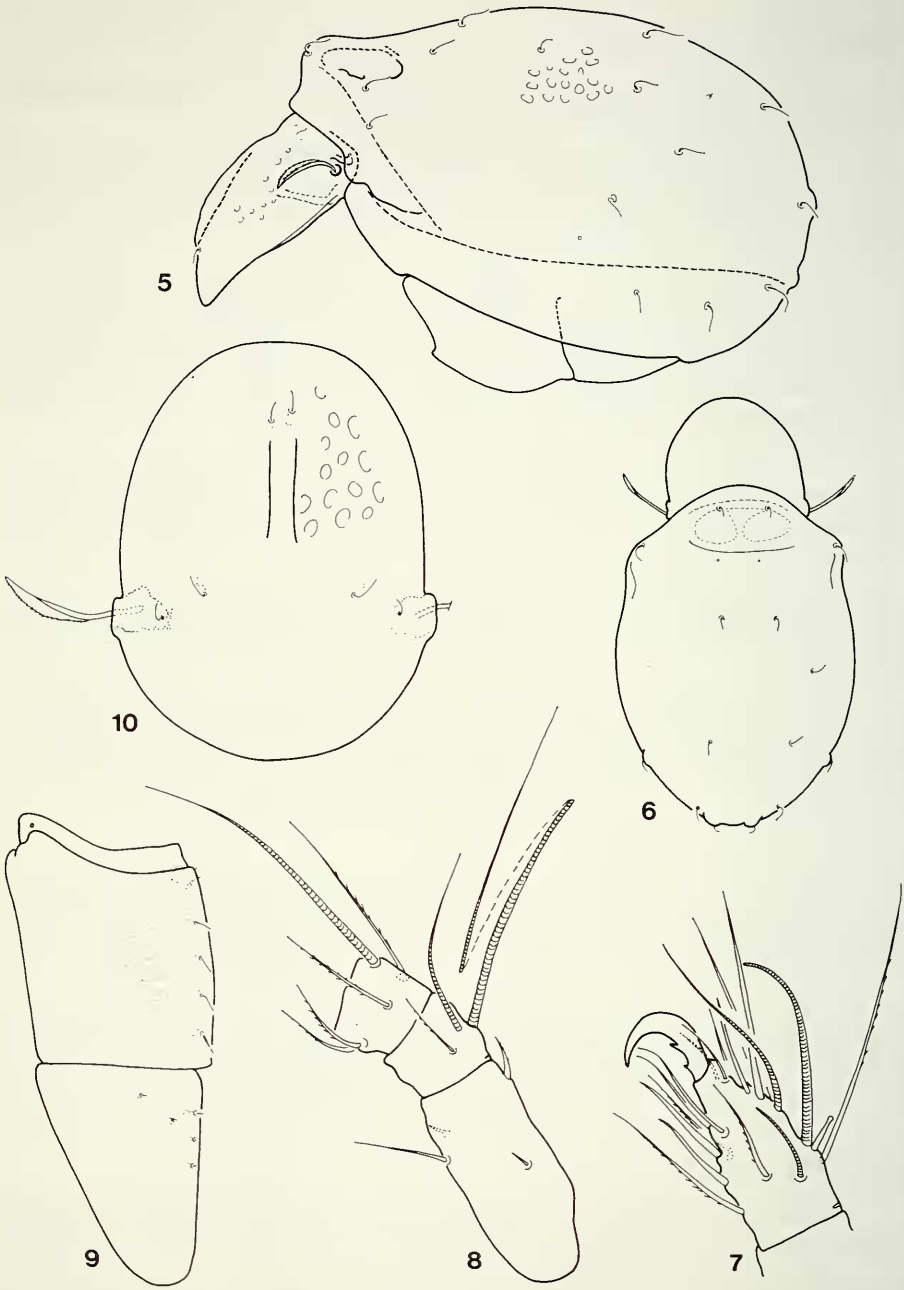
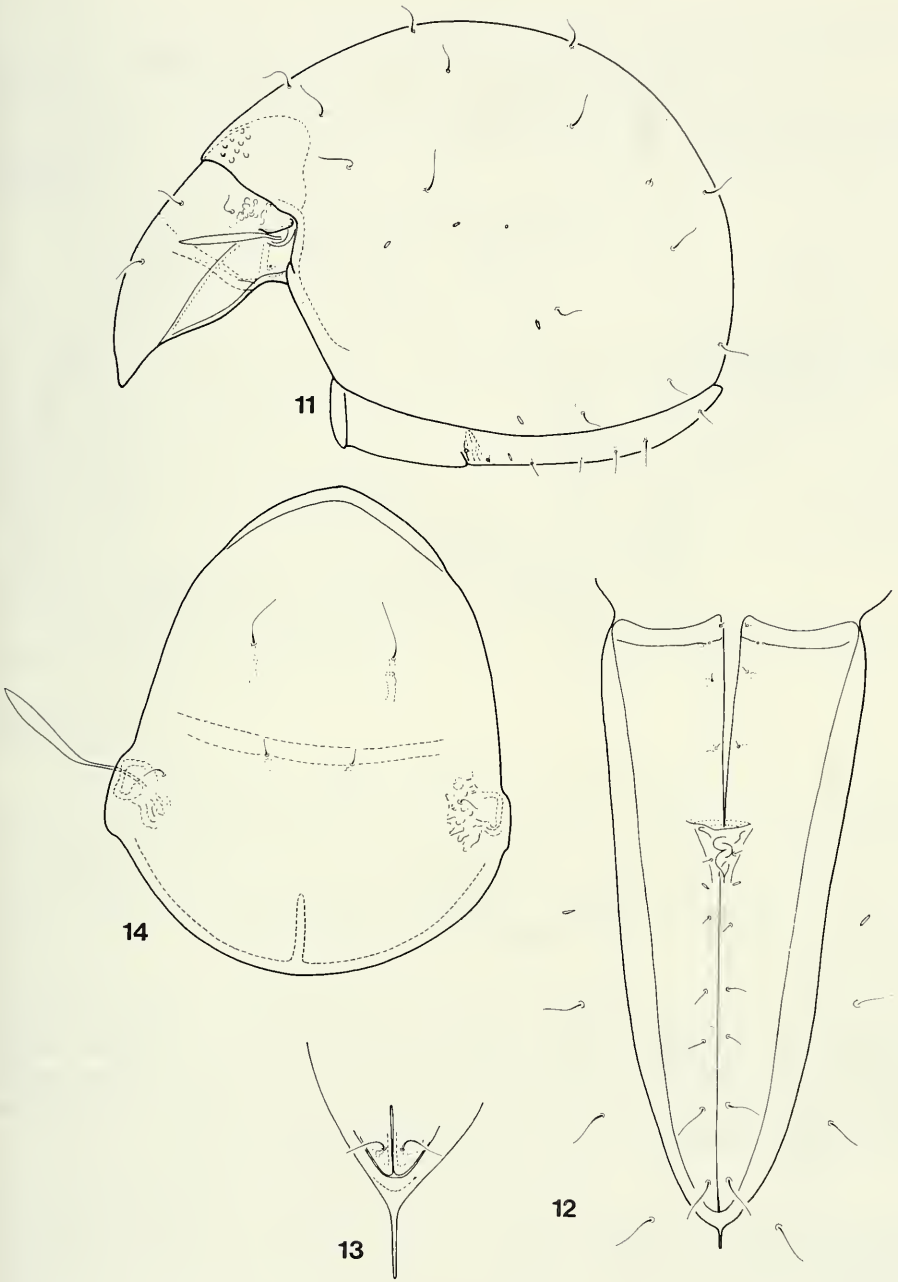
[1] MHNG = deposited in the Muséum d'Histoire naturelle, Genève.

[2] HNHM = deposited in the Hungarian Natural History Museum, Budapest, with identification number of the specimens in the Collection of Arachnida.



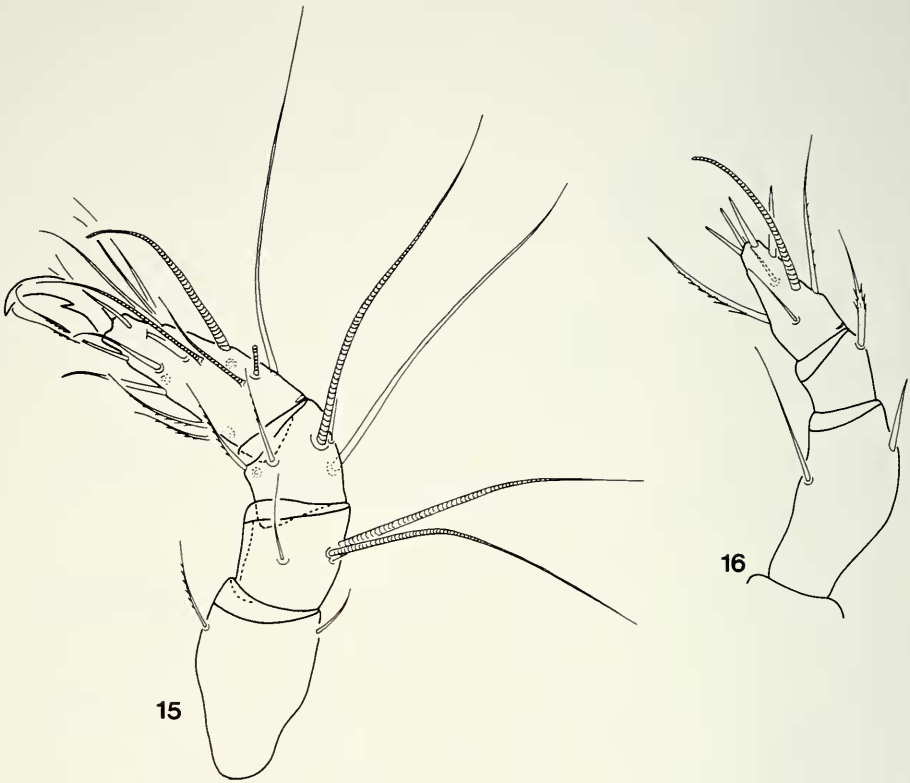
FIGS 5-10.

Hoplophorella lemuria sp. n. - 5: body in lateral view, 6: body in dorsal view, 7: tarsus of leg I, 8: tibia, genu and femur of leg I, 9: anogenital region, 10: aspis in dorsal view.



FIGS 11-14.

Microtritia hauseri sp. n. - 11: body in lateral view, 12: anogenital region, 13: notogastral fissure, 14: aspis in dorsal view.



Figs 15-16.

Microtritia hauseri sp. n. - 15: leg I, 16: palp.

A s p i s : Posteromedian and laterocentral apodemes well developed, long. Lateral carina strong, fused with the lateral rim (Fig. 11). All setae very fine, among them the rostral ones much longer than the lamellar or interlamellar pairs. Rostral setae originating comparatively far from the rostrum and standing much farther from each other than the lamellar ones (Fig. 14). Sensillus spindle-shaped, smooth.

N o t o g a s t e r : On the inner surface of the anterodorsal part some strong foveolae observable. All setae fine, curved. Only four pairs of lyrifissures visible (*ip* absent), *ia* originating far from setae c_3 or *cp*. Terminal fissure (Fig. 13) well developed.

A n o g e n i t a l r e g i o n : Four pairs of genital setae present but two of them anterior to tectum *kag*. (I did not find the aggenital setae.) All setae on anoadanal plates well visible, setae a_1 arising on the surface of the interlocking triangle, far anteriorly to the lyrifissures *iad* (Fig. 12).

G n a t h o s o m a : Both setae *ch* on chelicera smooth and spiniform. Palp 3-segmented, with setal formula 2-1-8+1. Seta *d* of tibia very strong.

L e g s : Seta *d* on femur I of normal length, no seta on genu IV. Otherwise the leg chaetotaxy is almost identical to that of the other species of the genus. Leg setal formulae:

I: 1-2-3+2-5+1-16+3(?)-1
II: 1-2-3+1-2+1-14+2-1
III: 1-2-2+1-2+1-9-1
IV: 1-1-0-2+1-8-1

M a t e r i a l e x a m i n e d : Holotype: Mad-89/3, 3 paratypes from the same sample. Holotype and 2 paratypes: MHNG and 1 paratype (1389-PO-1990) : HNHM.

R e m a r k s : On the basis of the form of the sensillus, the notogastral fissure and the comparatively large body the new species stands nearest to *M. incisa* Märkel, 1964. However, it can be distinguished from *M. incisa* by the following characters: lyrifissures *iad* originating far from the interlocking triangle (close to it in *M. incisa*), only two pairs of genital setae arising behind tectum *kag* (4 pairs in *M. incisa*) and no seta *d* on genu IV (a small seta visible on genu IV in *M. incisa*).

I dedicate this new species to my friend Dr. B. Hauser (Geneva) who organized this zoological research in Madagascar.

Nosybea gen. n.

DIAGNOSIS: Lamellae wide, covering the rostrum in dorsal view, not connected to each other. Lamellar setae arising on the dorsal surface. Tutorium reduced, without cusp. Notogaster with crests and hollows (one median crest strong and conspicuous), well developed humeral projections, characteristic but small lateral excavation on each side, 11 pairs of setae (*da*, *dp* absent), three pairs of lyrifissures. Pedotecta 1, 2-3 and the discidium strongly developed. Coxisternal region with 12 round, deep hollows, formed by epimeral borders. Epimeral setae partly (*1a*, *2a*, *3a*) reduced. Genital and anal openings large, quadratic, originating near each other. Anogenital setal formula: 4-1-2-2. Lyrifissures *iad* in paraanal position. Palpal eupathidium *acm* with the solenidium arising on the surface, in the anterior part of tarsus. Mentum wide, rutellum strongly narrowed anteriorly. All legs monodactylous, tibia and tarsi without any stronger structure. Solenidium φ_1 and φ_2 arising on the surface without tubercle.

T y p e s p e c i e s : *Nosybea genavensis* sp. n.

R e m a r k s : At first this new taxon seems to be a transitional form between *Charassobates* Grandjean, 1929, and *Topalia* Balogh & Csiszár, 1963, belonging to the family *Charassobatidae*. But the presence of pedotecta 2-3, the reduced tutorium, the absence of the circumpedal carina, the quadratic genital and anal apertures with paraanal lyrifissures *iad* and the absence of tibial tubercle for solenidia on tibia I, indicate such a difference from *Charassobates* that it is necessary to establish a new family:

Nosybeidae fam. n.

Type genus: *Nosybea* gen. n.

Remarks: The reexamination of the type species of *Topalia* (*T. problematica* Balogh & Csiszár, 1963) showed that it stands much closer to *Nosybea* than to the genus *Charassobates* and has to be transferred into the new family, as probably also the genus *Lamellocepheus* Balogh, 1961. *Topalia* Balogh & Csiszár, 1963 and the new genus can be distinguished as follows:

Topalia	*Nosybea*
1. Notogaster with 1-2 pairs of longitudinal crests.	1. Notogaster with 1 unpaire median crest.
2. Notogaster without excavation.	2. Notogaster with lateral excavations.
3. Coxisternal region with opposite apophyses but without ring-shaped thickenings.	3. Coxisternal region without opposite apophyses but with 12 ring-shaped thickenings.
4. Epimeral setal formula: 3-1-3-3.	4. Epimeral setal formula: 2-0-2-3.

Like Behan-Pelletier (1987), but in opposition to Aoki & Fujikawa (1972), I do not place *Topalia* in relationship with *Ametroproctus* (*Coropoculia*) or other Cymbaeremaeoid genera. The true position of *Nosybeidae* may probably be in relation with *Eutegaeidae* or *Cepheidae*.

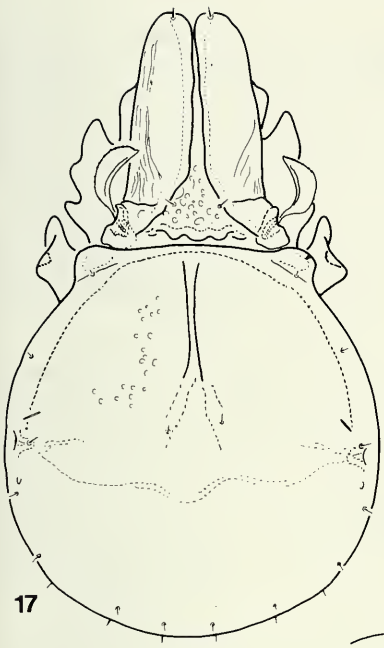
Nosybea genavensis sp. n.

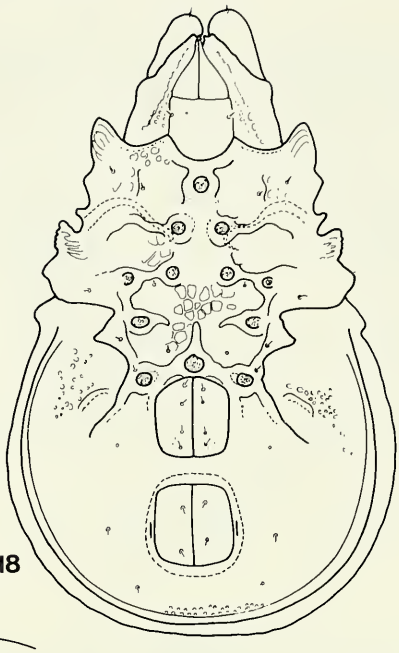
Measurements. - Length of body: 276-291 µm, width of body: 170-194 µm.

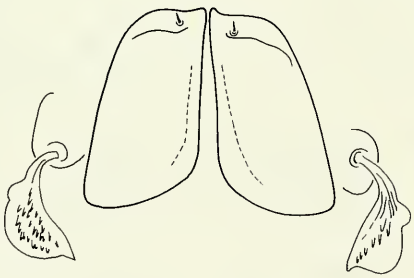
Integument: Whole body surface, also the legs, incompletely covered with a waxy layer of cerotegument. Mostly it consists of small granules. The cuticular surface is diversified, smooth, irregularly foveolated or rugose.

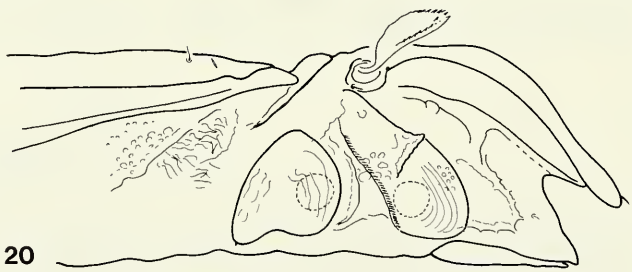
Prodorsum: Rostral apex deeply incised, with one hollow beside it on each side (Fig. 19). Lamellae wide, overlapping the rostrum, but not touching medially and not connected by a translamella. Lamellar surface with some, nearly longitudinal rugae basally and a strong transversal crest in front of the bothridium. The bothridium is cup-shaped, opened laterally. In the interlamellar region a strong waved transversal lath, with three tubercles directed backwards (Fig. 17). Tutorium weakly developed, without cuspis. Rostral setae fine, lamellar setae short, arising on the lamellar surface. Interlamellar setae spiniform, originating on small tubercles in the interlamellar region. Exobothridial setae minute, also spiniform, originating on the bothridial margin. Sensillus asymmetrically dilated, its outer surface spiculate, directed forwards.

Notogaster: A pair of well defined humeral projections present, which are well framed also basally. Notogastral surface with an unpaired, strong median crista on the anterior part and one pair of much weaker transversal cristae. Median fields and



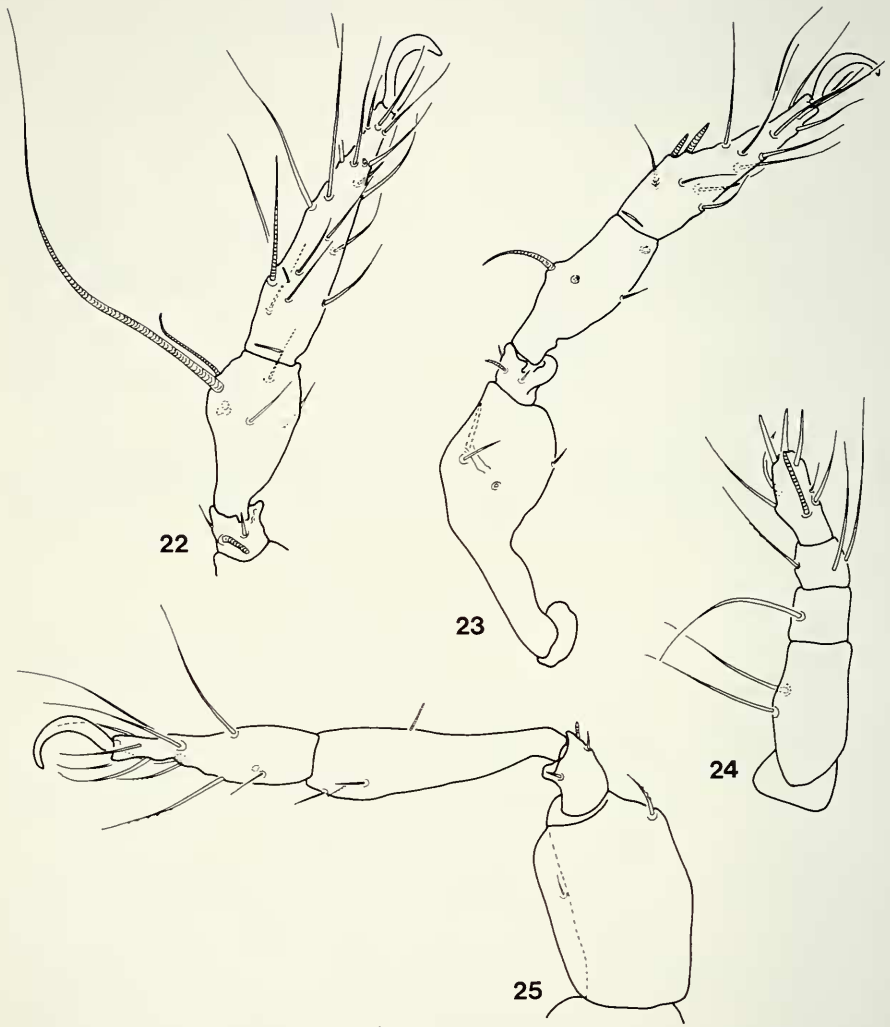






FIGS 17-21.

Nosybea genavensis gen. n., sp. n. - 17: body in dorsal view, 18: body in ventral view, 19: prodorsum in anterior view, 20: podosoma in lateral view, 21: chelicera.



FIGS 22-25.

Nosybea genavensis gen. n., sp. n. - 22: leg I, 23: leg II, 24: palp, 25: leg IV.

the posteromedian part of notogaster slightly concave. One pair of small lateral excavations present, the setae *lm* arising usually on their margin. Eleven pairs of notogastral setae present, the setae *da* and *dp* only exceptionally and asymmetrically present. Lyrifissures *ia* long, *im* hardly observable in front of the excavation, *ips* well visible in lateral view. (I was not able to find the *ip* and *ih*, both probably absent.)

Lateral region of podosoma: Pedotecta 1 and 2-3 very large, the latter bent dorsally and directed to the humeral projection. Their surface ornamented by parallel lines on their anterior margin and by large basal alveoli (Fig. 20). Discidium sharply pointed laterally. Circumpedal carina absent.

Ventral region: Apodemes weakly developed, hardly observable. Epimeral borders well sclerotized, they compose 5 paired and 2 unpaired ring-shaped structures, which frame deep hollows or small excavations (Fig. 18). These hollows are filled with secretion. Epimeral surface ornamented by reticulation and some large alveoli on the anterolateral part of epimeres 1. Epimeral setae partly reduced, the remaining ones very short. Epimeral setal formula: 2-0-2-3. Surface of the anal plate laterally areolated between the acetabula of leg IV and the lateral margin. No apophyses in the anogenital region. All setae in anogenital region minute, with setal formula: 4-1-2-2. Lyrifissures *iad* long, in paraanal position.

Gnathosoma: Mentum wide, setae *h* arising marginally. Rutellae strongly narrowed anteriorly. Chelicerae elongate, but with normal small digits with teeth (Fig. 21). Both setae *ch* strong, ciliate. Palp (Fig. 24) 5-segmented, its setal formula: 0-2-1-3-8+1. All 4 eupathidia arising anteriorly, no essential difference between them.

Legs: All claws long, comparatively thin. Joints of legs normal, without any strong tubercles on the elongated tibia and tarsus. All femora with a ventral crest or bladelike formation. Setal formula of legs:

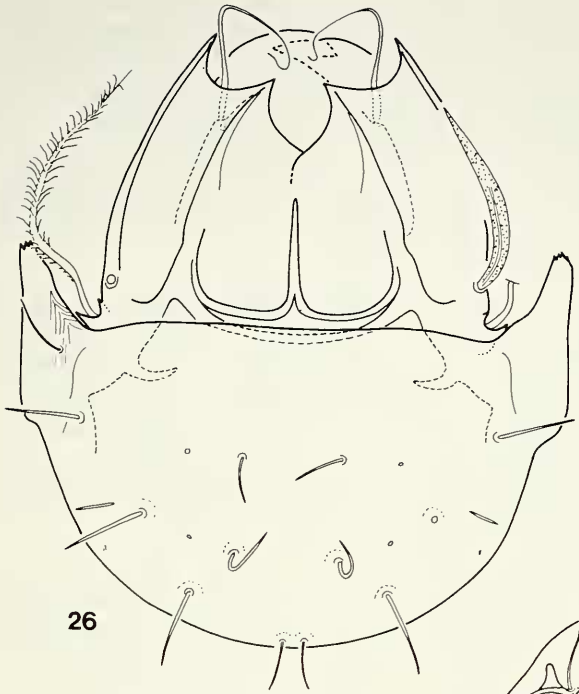
I: 5-3+1-4+2-18+2-1 (Fig. 22)
II: 4-2+1-4+1-15+2-1 (Fig. 23)
III: 3-2+1-3+1-14-1
IV: 2-2+1-3+1-12-1 (Fig. 25)

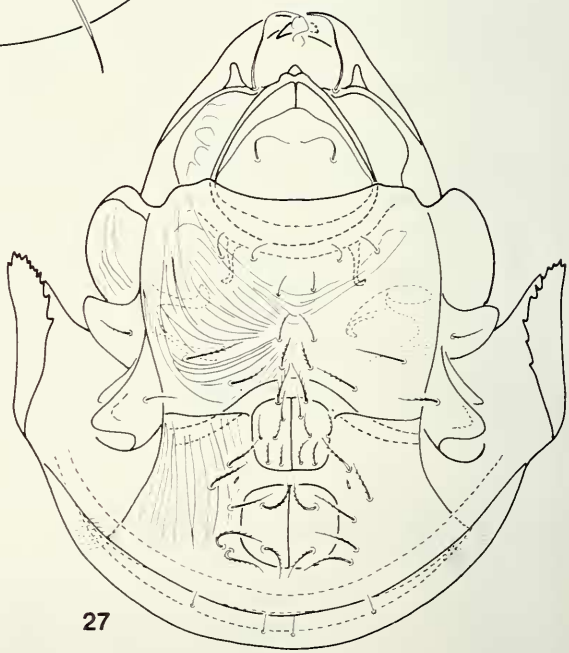
Material examined: Holotype: Mad-89/34, 24 paratypes from the same sample. Holotype and 14 paratypes: MHNG and 10 paratypes (1390-PO-1990): HNHM.

Acaroceras (**Malgoceras** subgen. n.) **helleri** sp. n.

Measurements. - Length of body: 234-245 µm, width of body: 219-232 µm.

Prodorsum: Rostral apex beak-shaped, bent downwards, not visible in dorsal view. Lamellae very wide, their median parts overlapping, each with a large, sharp median tooth, outer part dentate. Above the rostrum there is one pair of long, horn-shaped structures (Fig. 28), at their basis arising the simple, curved rostral setae. Lamellae connected in the interlamellar region. In front of this connection a sharp, long





FIGS 26-27.

Acaroceras (Malgoceras) helleri sp. n. - 26: body in dorsal view, 27: body in ventral view.

spine present composed basally of two branches (Fig. 26). Fibrous cerotegument fills up the interlamellar region. Lamellar setae arising from the ventral surface of the lamellae, on tubercles. Interlamellar setae arising laterally on the lamellar surface. Sensillus setiform, directed forwards, bilaterally ciliate, surface covered by granules. Tutorium very large, its distal end strongly dilated, with some teeth on its dorsal margin.

Notogaster: Dorsosejugal suture complete. Pteromorphae very large, their anterior and lateral margins serrated (Fig. 29). Nine pairs of mostly robust notogastral setae present.

Lateral part of podosoma: Pedotecta 1 very large, with strong transversal rugae. Pedotecta 2-3 and discidium normal in shape.

Coxisternal region: Surface ornamented by fine striae mostly directed to a median point (Fig. 27). Epimeral setae - excepting the setae of epimeres 1 and 2 - strong, well ciliate.

Anogenital region: Ventral plate also striated. All setae of this region strong, also well ciliate. Two pairs of aggenital setae. Lyrifissures *iad* originating in preanal position.

Material examined: Holotype: Mad-89/34, 1 paratype from the same sample. Holotype: MHNG and paratype (1391-PO-1990): HNHM.

Remarks: This species fits well into the genus *Acaroceras* Grandjean, 1936, but beside of a number of characters at the species level (e.g. the lamellar cusps, the dilated interlamellar setae and the form of pteromorpha) the new species differs from each congener by two very important features:

1. The number of aggenital setae (one pair in the other species).
2. The position of the lyrifissures *iad* (paraanal in all other species).

Therefore (and considering, that all other species were described from South America) I establish a new subgenus: Malgoceras subgen. n.

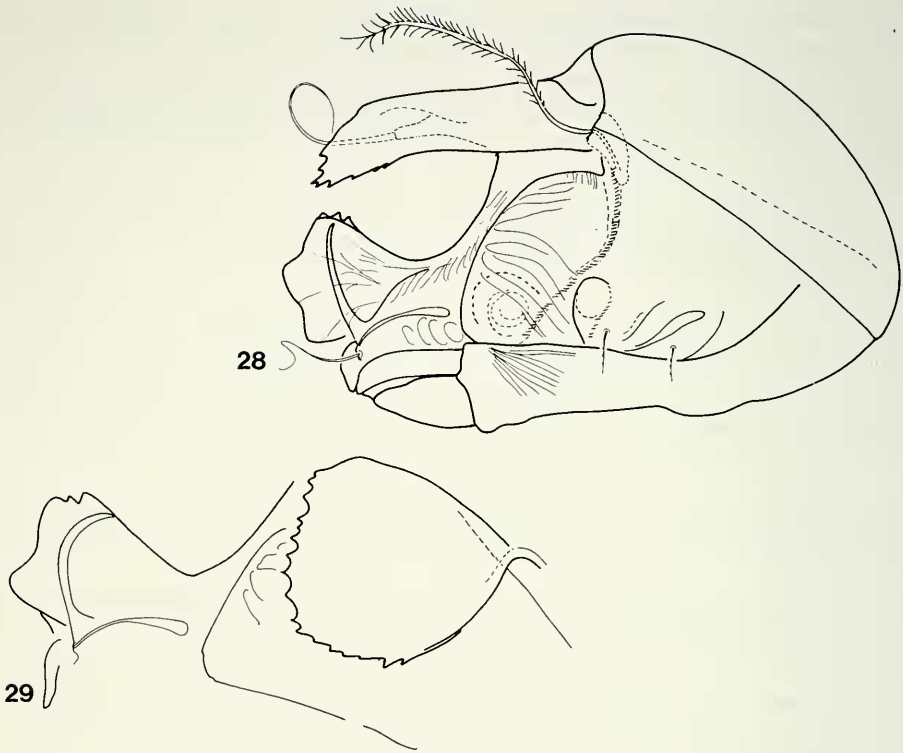
Type species: *Acaroceras* (*Malgoceras*) *helleri* sp. n.

I dedicate this new species to Max Heller, chargé d'affaires of the Swiss Embassy in Antananarivo, who contributed decisively to the success of the Geneva Expedition by his invaluable help.

Hymenozetes quadricornutus sp. n.

Measurements. - Length of body: 352-377 µm, width of body: 263-285 µm.

Prodorsum: Lamellae very wide, covering the largest part of the prodorsum in dorsal view. Both of their cusps very sharp, large, one of them thicker, their basal (inner) part overlapping(Fig. 30), outer cusp narrower but longer. Basal part of lamellae connected by an arched band. Lamellar setae arising from a deep hollow between the cusps, long, flagellate; interlamellar setae originating on the inner margin



FIGS 28-29.

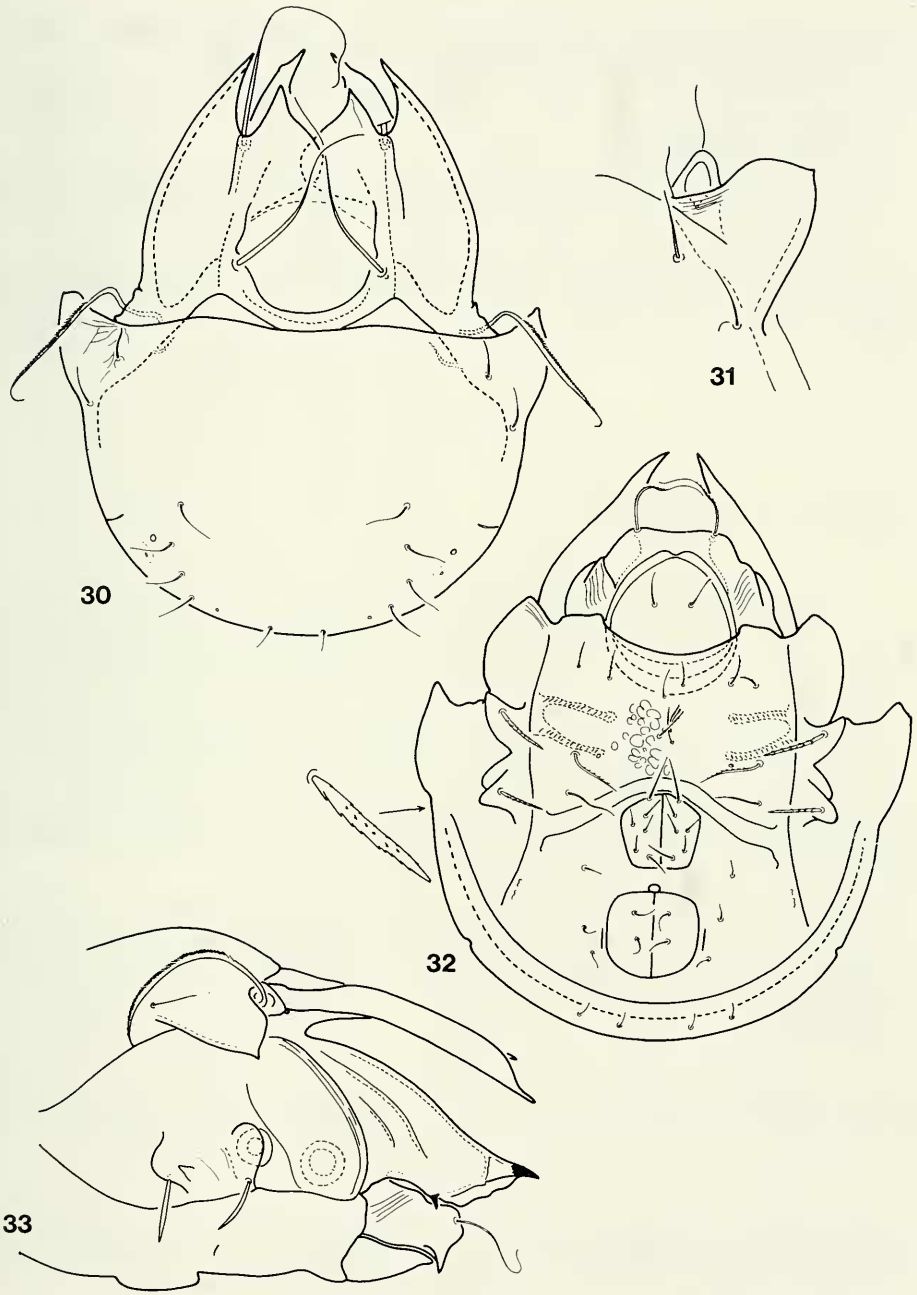
Acaroceras (Malagoceras) helleri sp. n. - 28: body in lateral view, 29: pteromorpha and tutorium in lateral view.

of lamellae, long, flagellate. Sensillus directed outwards and backwards, its outer surface distinctly barbed. Rostrum beak-shaped, but straight in dorsal view. Rostral setae long, directed inwards, conspicuously ciliate. Tutorium very large, with very sharp and strongly sclerotized cuspis, directed anteriorly, and a smaller cuspis, directed ventrally (Fig. 33).

N o t o g a s t e r : Dorsosejugal suture complete, concave medially. Pteromorphae small, with pointed cusp laterally. Its surface smooth. Seven pairs of notogastral setae strong and long, two pairs in posteromarginal position much smaller than the others.

L a t e r a l p a r t o f p o d o s o m a : Pedotecta 1 very large, with some parallel lines to its superior margin. Discidium comparatively small.

C o x i s t e r n a l r e g i o n : Surface ornamented by irregular spots or smaller areolae. All epimeral setae strong and comparatively long, well ciliate. Setae *2a*



FIGS 30-33.

Hymenozetes quadricornutus sp. n. - 30: body in dorsal view, 31: pteromorpha in lateral view, 32: body in ventral view, 33: podosoma in lateral view.

and *3a* arising near to each other in the middle of the epimeral region. Setae *3c* and *4c* arising on pedotecta and on discidium (Fig. 32).

Anogenital region: Anogenital setal formula: 6-1-2-2. Lyrifissures *iad* long, in paraanal position.

Material examined: Holotype: Mad-89/34, 2 paratypes from the same sample. Holotype and 1 paratype: MHNG, 1 paratype(1392-PO-1990): HNHM.

Remarks: On the basis of the form of lamellar cusps and also on the form of the tutorium the new species is well distinguishable from the type of the genus *Hymenozetes* (*H. mirabilis* Balogh, 1962), which has been redescribed by MAHUNKA (1990).

Megazetes nosybe sp. n.

Measurements. - Length of body: 198-232 µm, width of body: 168-188 µm.

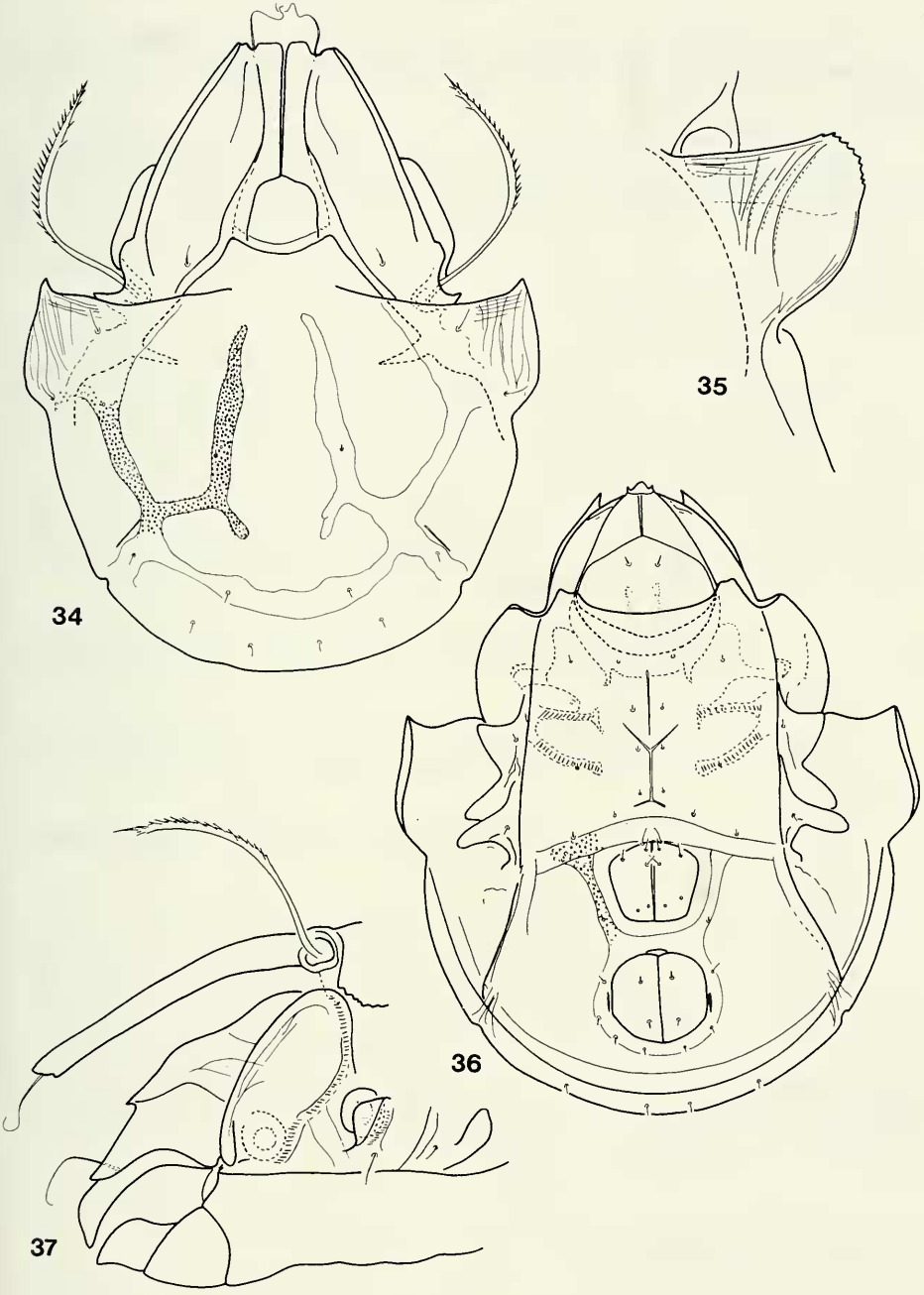
Prodorsum: Lamellae very wide, covering the prodorsum. Their anterior parts touching medially, inner margins parallel, connected by a narrow transversal lath basally (Fig. 34). Apices not well developed, their anterior margin rounded medially, hollowed by the insertion of lamellar setae and with a minute tooth laterally. Lamellar setae flagellate, interlamellar ones short, arising on the lamellar surface. Sensillus directed forwards, slightly asymmetrically thickened medially with strong spines on its outer surface. Rostrum beak-shaped, bent downwards (Fig. 37), in dorsal view it seems straight anteriorly. Rostral setae also thin, flagellate. Tutorium very large, with a sharp apex and a well developed median tooth on its superior margin.

Notogaster: Dorsosejugal suture interrupted medially. Dorsal surface ornamented by a continuous, shallow dish covered by cerotegument-granules. Its form resembling a hip-bone (Fig. 34). Pteromorphae well developed, with small teeth on their anterolateral margin (Fig. 35) and their dorsal surface with longitudinal and transversal rugae.

Lateral region of the podosoma: Pedotecta 1 very large, with 2-3 striae parallel with their superior margin. Pedotecta 2-3 comparatively small, discidium also very large, with tongue-shaped posterior part.

Coxisternal region: On the surface appears a very characteristic median structure consisting of a straight line anteriorly and of a line which is bifurcate posteriorly (Fig. 36). On the posterior border of this region a broad transversal band observable, its surface covered by secretion granules. Epimeral setae minute.

Anogenital region: Genital and anal apertures framed commonly by a shallow fossa as on dorsal surface, covered also by secretion granules (Fig. 36). Genital setae conspicuously short, simple. Three pairs of adanal setae present.



FIGS 34-37.

Megazetes nosybe sp. n. - 34: body in dorsal view, 35: pteromorpha in lateral view, 36: body in ventral view, 37: podosoma in lateral view.

Material examined: Holotype: Mad-89/34, 9 paratypes from the same sample. Holotype and 5 paratypes: MHNG and 4 paratypes (1393-PO-1990): HNHM.

Remarks: The new species can be distinguished from all congeners on the basis of the conspicuous shallow fossae on the dorsal and ventral surfaces, covered by cerotegument-granules, and the pattern of the coxisternal region.

Rhopalozetes madecassus sp. n.

Measurements. - Length of body: 188-228 µm, width of body: 145-158 µm.

Prodorsum: Rostrum beak-shaped in lateral view (Fig. 39), conical in dorsal view. Rostral setae originating on the dorsal surface, simple, short. Lamellae long, strongly narrowing anteriorly, with sharp outer and reduced innercusps. Inner margin of lamellae straight, parallel and connected basally (Fig. 38). Lamellar setae very short, thick, with long cilia. Interlamellar setae fine, comparatively short, arising medially on the anterior surface of lamellae. Peduncle of the sensillus conspicuously long, its head barbed (Fig. 41). Tutorium well developed, with sharp cusp.

Notogaster: Dorsosejugal suture interrupted medially. Notogastral surface smooth, some rugae observable only on the pteromorphal surface. All nine pairs of notogastral setae fine, short.

Lateral part of podosoma: Pedotecta 1 large, a sharp edge runs parallel with its anterior margin. Lateral field above the acetabula of leg II and III granulated.

Coxisternal region: Without any characteristic sculpture. Epimeral setae minute, all arising in regular position (Fig. 40).

Anogenital region: All setae also minute in this region, only the anterior pair of genital setae longer than the others. Three pairs of adanal setae present.

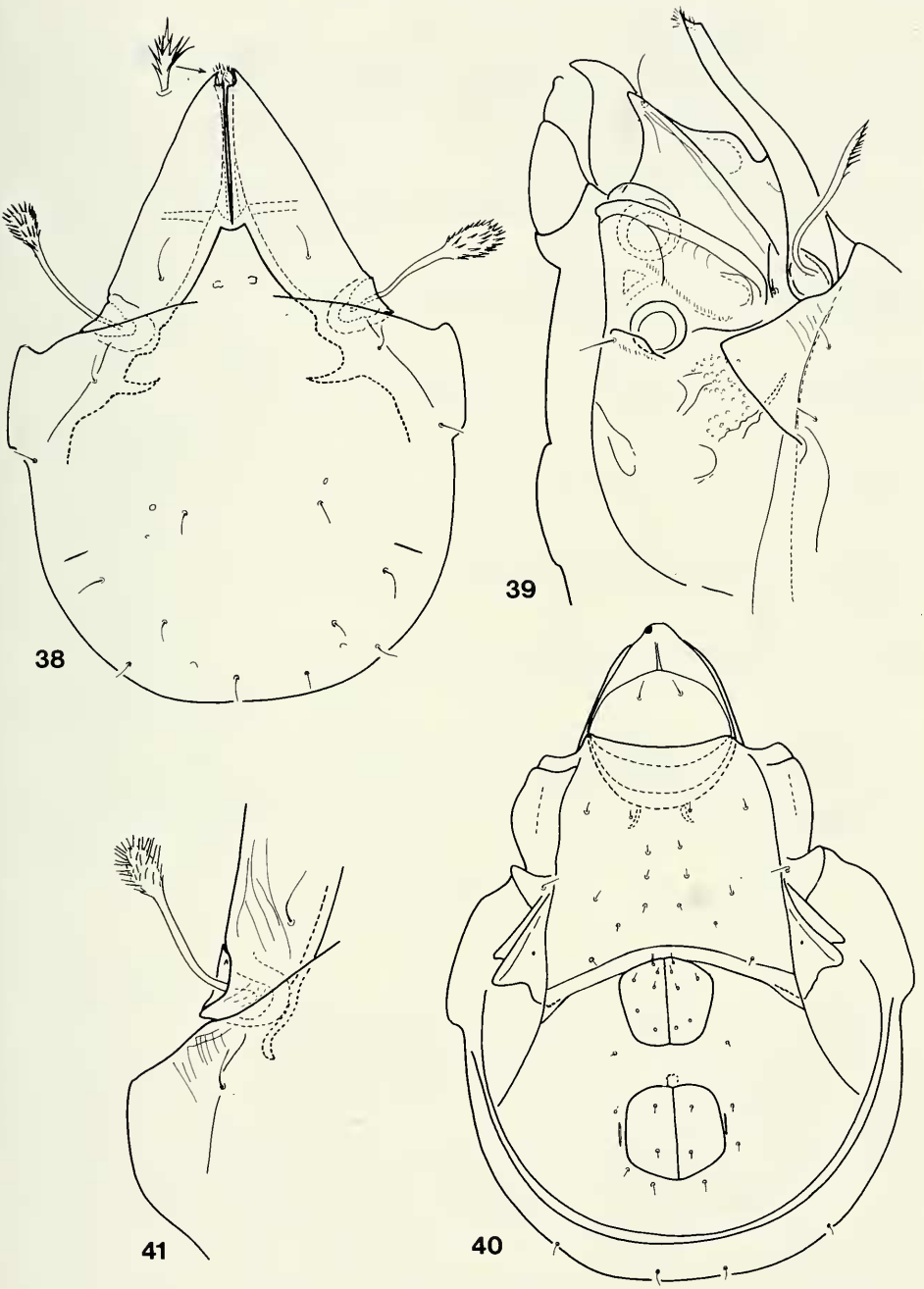
Material examined: Holotype: Mad-89/3, 4 paratypes from the same sample. Holotype and 2 paratypes: MHNG and 2 paratypes (1394-PO-1990): HNHM.

Remarks: This new species stands very close to the type species of the genus *Rhopalozetes* Balogh, 1962, also described from Madagascar. It can be distinguished from the new species by the incised distal cusp of lamella, by the absence of the basal connection between the lamellae and by the form of the lamellar setae.

Rhopalozetes lokobensis sp. n.

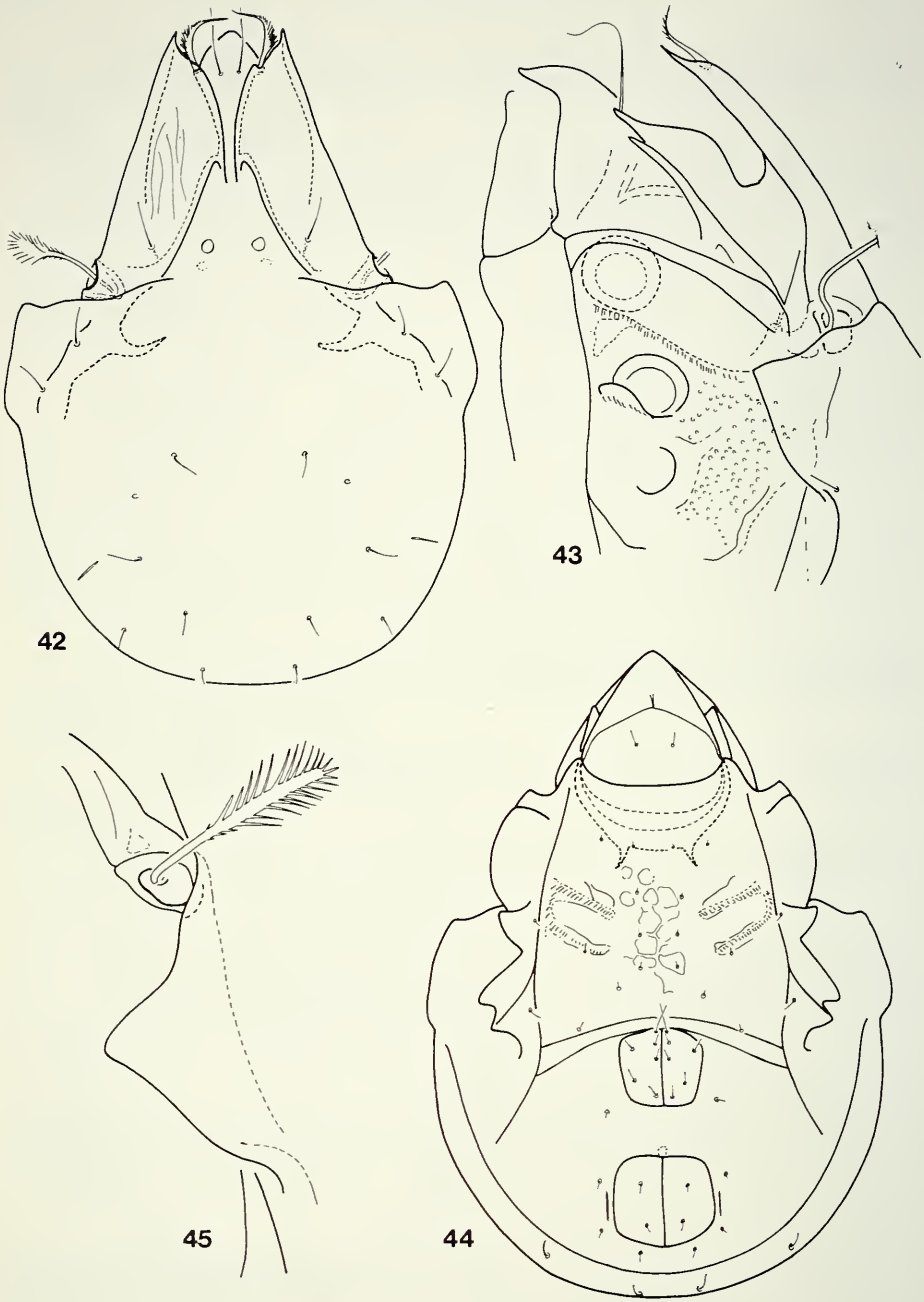
Measurements. - Length of body: 237-268 µm, width of body: 168-193 µm.

Prodorsum: Rostrum beak-shaped in lateral view (Fig. 43), conical and well visible between the lamellae in dorsal view (Fig. 42). Rostral setae arising on its



FIGS 38-41.

Rhopalozetes madecassus sp. n. - 38: body in dorsal view, 39: podosoma in lateral view, 40: body in ventral view, 41: pteromorpha in lateral view.



FIGS 42-45.

Rhopalozetes lokobensis sp. n. - 42: body in dorsal view, 43: podosoma in lateral view, 44: body in ventral view, 45: pteromorpha in lateral view.

surface. Lamellae not touching medially, narrowed anteriorly, with long and sharp lateral cusp. Inner cusps absent, the basally thickened and unilaterally well ciliate lamellar setae arise on the base of the cusps. Interlamellar setae arising on the lamellar surface nearer to the inner margin than to the lateral margin. Tutorium (Fig. 43) with long, sharp cusps, and dilated basal part. Sensillus (Fig. 45) directed outwards and forwards, its head slightly dilated, with characteristically varying spines (distal ones shorter than median ones).

N o t o g a s t e r : Dorsosejugal suture interrupted medially. Pteromorphae small, with triangular apex laterally. Surface of notogaster smooth. Nine pairs of simple notogastral setae present.

L a t e r a l p a r t o f p o d o s o m a : Pedotecta 1 large, pedotecta 2-3 small, both without characteristic sculpture. Above the acetabulum of leg II-IV a large granulated area (Fig. 43).

C o x i s t e r n a l r e g i o n : On this surface only weak polygonal sculpture visible. All epimeral setae minute.

A n o g e n i t a l r e g i o n : All setae also simple in this region, the anterior genital setae are longer than the others. Three pairs of adanal setae present. Lyrifissures *iad* in paraanal position.

M a t e r i a l e x a m i n e d : Holotype: Mad-89/3, 3 paratypes: same sample; 6 paratypes: Mad 89/34. Holotype and 6 paratypes: MHNG, 3 paratypes (1395-PO-1990): HNHM.

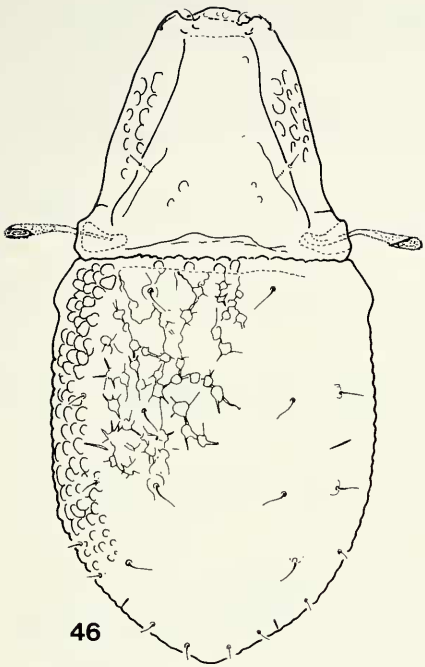
R e m a r k s : The new species is well assignable to the genus *Rhopalozetes* Balogh, 1962, but it shows the great diversity of this group. The new species is well characterised by the form of the lamellae and on this basis it is well distinguishable from all known species of the genus.

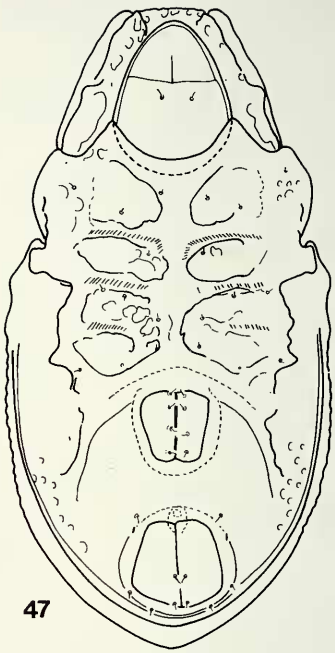
Carabodes andasibe sp. n.

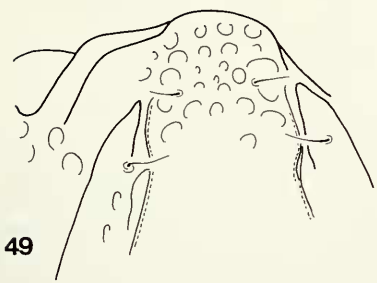
M e a s u r e m e n t s . - Length of body: 247-277 µm, width of body: 133-140 µm.

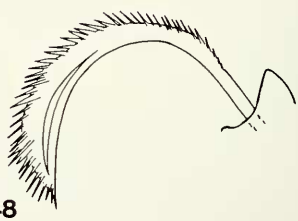
P r o d u r s u m : Rostrum wide, convex medially. Lamellae normally developed, with small cusps (Fig. 49). Lamellar and rostral surface ornamented by irregular large alveoli, interlamellar region smooth, its basal part slightly concave with some irregular spots. All prodorsal setae short, thin, rostral and interlamellar setae simple, the lamellar ones ciliate. Sensillus (Fig. 48) directed outwards and curved backwards, distinctly barbed, the barbs darker than the colour of the other parts of body.

N o t o g a s t e r : Dorsosejugal suture straight. Notogaster ornamented by a peculiar sculpture (Fig. 46): anterior and lateral margin with large pustules, median part with irregular "amoeboid" stellate tubercles. Posterolateral margin smooth, this part slightly flattened and elongated. Ten pairs of thin, comparatively long notogastral setae present.



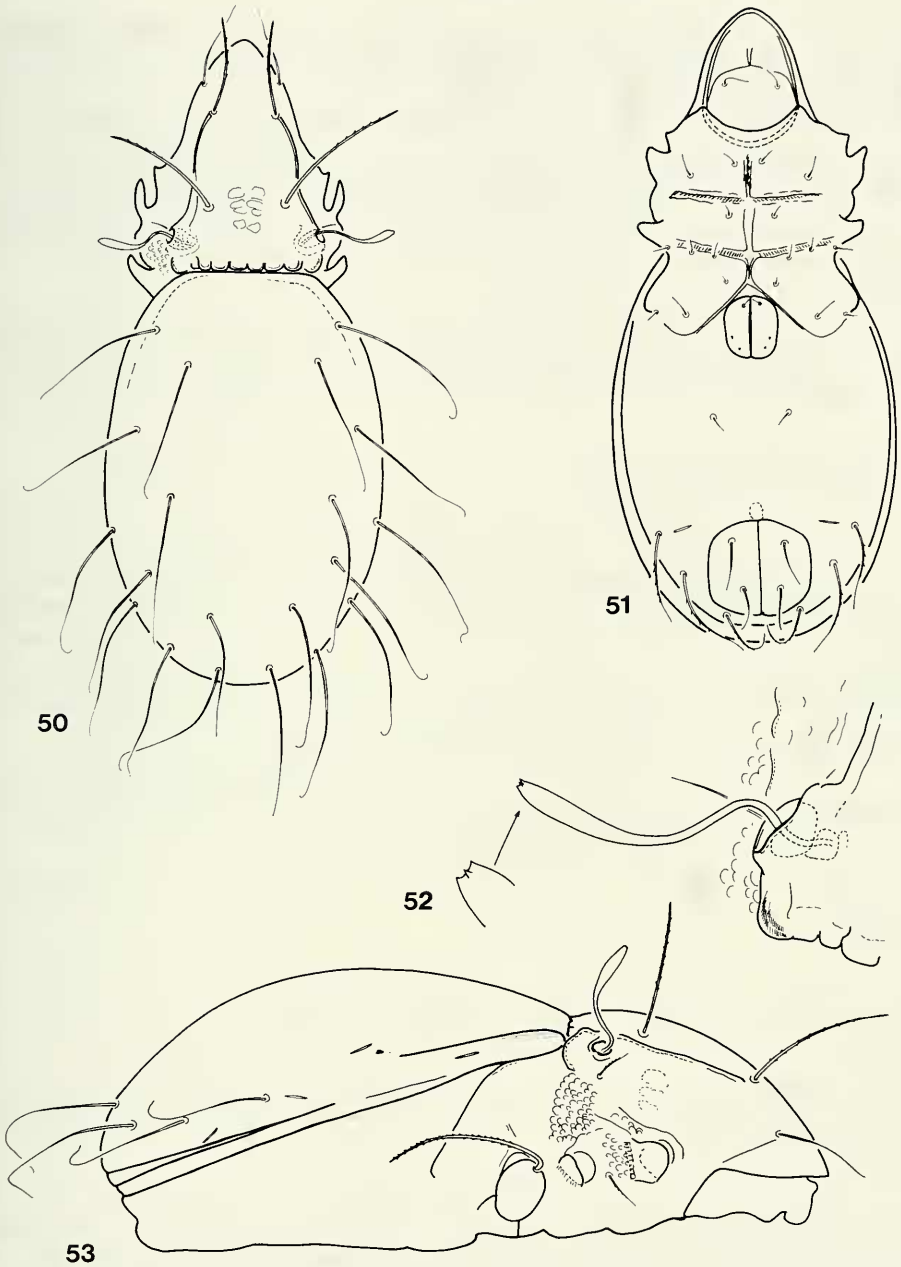






FIGS 46-49.

Carabodes andasibe sp. n. - 46: body in dorsal view, 47: body in ventral view, 48: sensillus, 49: rostral part of prodorsum.



FIGS 50-53.

Pseudotocepheus lienhardi sp. n. - 50: body in dorsal view, 51: body in ventral view, 52: trichobothrium, 53: body in lateral view.

Coxisternal region: Epimeral borders and apodemes well developed, epimeral surfaces with irregular spots. All epimeral setae minute, their setal formula: 3-1-3-3.

Anogenital region: Ventral plate with some lateral alveoli, its median surface smooth. A strong semicircle and a thick ring on its two sides well observable (Fig. 47). Anogenital setal formula: 4-0-2-3, aggenital setae completely reduced.

Material examined: Holotype: Mad-89/3, 16 paratypes from the same sample. Holotype and 10 paratypes: MHNG and 6 paratypes (1396-PO-1990): HNHM.

Remarks: On the basis of the peculiar sculpture of the notogaster the new species differs from all known species of the genus *Carabodes* C.L. Koch, 1835 (see MAHUNKA 1986).

Pseudotocepheus lienhardi sp. n.

Measurements. - Length of body: 460-629 μm, width of body: 202-312 μm.

Prodorsum: Rostrum conical. Lamellae very narrow, slightly S-shaped, in some cases not reaching the lamellar setae. Four to five pairs of continuous median condyles present (Fig. 50), the lateral and median condyles are identical but of variable number and form (sometimes 1-2 condyles fused with each other). Rostral setae filiform, lamellar and interlamellar ones longer but their tips needle-shaped. Sensillus directed outwards, its head blunt with 2-3 small spines (Fig. 52).

Notogaster: Surface smooth. Notogastral condyles absent. All setae long, thin, filiform with curved distal end. Lyrifissures *ih* originating in front of setae *lp*, *ip* originating between seta *lp* and r_3 (Fig. 53).

Lateral part of podosoma: Pedotecta 1 and 2-3 small. On pedotecta 1 and in the sejugal region, below the bothridium, a well pustulate field observable.

Coxisternal region: The insertions of epimeral setae are framed by a ring. All setae setiform, finely pilose. Epimeral setal formula: 2(!)-1-3-3. Setae *3a* arising very far from each other, near to setae *3b*.

Anogenital region: Genital plates darker than the other surface. Genital and aggenital setae short, anal and adanal ones conspicuously long. Lyrifissure *iad* in apoanal position (Fig. 51).

Legs: Type of the ultimate setae: L-L-S-S.

Material examined: Holotype: Mad-89/3, 13 paratypes from the same sample. Holotype and 8 paratypes: MHNG and 5 paratypes (1397-PO-1990): HNHM.

Remarks: On the basis of the unique form of prodorsal condyles the new species differs from all known *Pseudotocepheus* Balogh, 1962 species.

I dedicate the new species to Dr. C. Lienhard (Geneva) with thanks for his valuable help in the correction of my manuscripts.

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